

smaller. The median wing-coverts are broadly tipped with white, and the thighs, vent, and under tail-coverts whitish buff instead of pale cinnamon-brown. Iris lemon-white; bill and inside of the mouth black; feet grey.

Total length 190 mm.; culmen 24; wing 92; tail 86; tarsus 33.

In *L. barbacus* the wing-measurement varies considerably, from 108–117 mm. in males, and from 99–101 mm. in females.

*Hab.* Mufumbiro Volcanos and apparently extending its range to the southern shores of Lake Edward.

The type is in the British Museum. Adult. Vichumbi, 4.xii.10. Presented by Mrs. M. Roby.

The nearly *adult female*, shown in the background of the plate, was obtained by Mr. T. V. Fox. It is similar to the above, but has the back duller black and the vermilion of the throat tinged with yellowish.

## XVII.—*Remarks on the Syrinx of the Scolopacidæ.*

By W. P. PYCRAFT, M.B.O.U. &c.

(Text-figures 6–9.)

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HAVING recently had occasion to look somewhat closely into the life-histories of the Woodcock and the Snipes, at any rate of our British species, I made a point of examining one or two features of anatomical interest which had been discussed, and it seemed to me unsatisfactorily, by others. The following pages are submitted as a summary of these investigations, mainly in so far as they concern the syrinx. Other aspects will be dealt with later.

Historically there is little to be said. On looking up the literature of the subject I find that, contrary to my belief, a figure of the syrinx of the Jack Snipe was published

so long ago as 1884 by Wunderlich \*. The striking peculiarities of this syrinx are more or less correctly given—rather less than more,—but unfortunately the figure purports to be that of the syrinx of the Common Snipe (*Gallinago caelestis*). Dr. Gadow has reproduced the figure as that of "*Gallinago scolopacina*"—the Common Snipe—without comment. But there can be no question about the mistake, as those who refer to the figures given herewith may see. Recently a paper purporting to describe the syrinxes of the Jack Snipe and of the Common Snipe has appeared in the 'Zoologist' (vol. xv. ser. 4, p. 266), but this, and the figures which adorn it, cannot be taken as a serious contribution to the subject and need not be further mentioned.

Wunderlich fully realized the striking peculiarities of the syrinx, which he supposed to be that of the Common Snipe, and to him belongs the credit of pointing out that one of the Snipes, at least, possessed a syrinx so remarkable. Apparently he was not sufficiently familiar with the Jack and Common Snipes to enable him to distinguish between the two species, hence his unfortunate mistake. He was evidently unfamiliar with birds as seen from the field-ornithologist's point of view, as the latter is, for the most part, from that of the anatomist. Hence for years the error and the discovery alike remained unnoticed.

He was, however, profoundly impressed by the peculiarities which his dissection revealed. As he tells us: "Der untere Kehlkopf dieses Vogels gehört zu den sonderbarsten welche ich zu untersuchen Gelegenheit hatte. Fast drängt sich Einem die Ueberzeugung auf dass man hier mit einem Krankhaften Zustand zu thun hat." But this specimen was evidently a bird in good condition, and he speedily came to the conclusion that "ausser starker Fettdegeneration war keine Spur einer Krankheit zu finden." He failed, however, to properly interpret the curious intercalary

\* Wunderlich, L., "Beiträge zur vergleichenden Anatomie und Entwicklungsgeschichte des unteren Kehlkopfes der Vögel," Nova Acta der Kais. Leop.-Carol. Deutsch. Akad. der Naturfors. xlviii., 1884.

bar, of which I shall speak presently, and similarly misinterpreted the form of its accessory cartilage.

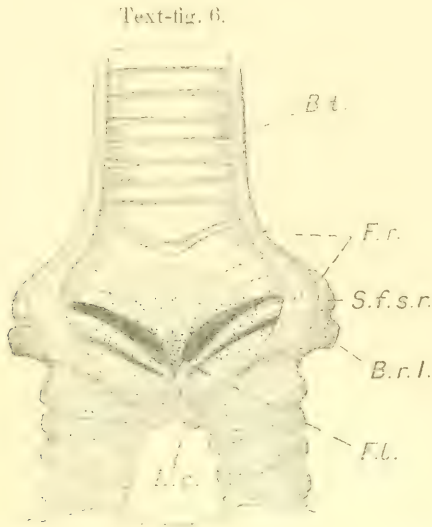
The writer in the 'Zoologist' just referred to may certainly claim to have been the first to attribute this peculiar syrinx to the Jack Snipe, but there his pretensions to fame must end, for the figures which purport to represent the syrinxes of the Jack and Common Snipe are grotesquely inaccurate, while his descriptions must come under the same condemnation.

The results of my own investigations may be briefly stated as follows:—

(1) *Jack Snipe*.—The syrinx of the Jack Snipe, so far as the evidence goes at present, differs not only from that of all other Scolopacidæ but also from that of all other Limicoline birds in at least one striking peculiarity to be described presently. To begin with, be it noted, it is formed of four more or less completely fused rings, of which only the most cephalad is complete. The remaining three form a gradually expanding series of incomplete rings, giving this end of the windpipe a roughly campanulate form, more strongly marked than in that of any other species of Scolopacidæ so far described (text-fig. 6, *F.r.*). Very well. Next comes a still more striking feature. Between this series of fused rings and what seems to answer to the first bronchial semi-ring is a semi-ring so closely bound by connective tissue to the syringeal fusion as to seem a part thereof. A little examination, however, will shew that this element is not fused therewith. Further, this semi-ring, as to its ventral end, is cartilaginous, and is attached by a bundle of short fibrous strands to the end of a lingulate plate of cartilage (text-fig. 6, *L.c.*). Caudad this plate rests against the mesial aspect of the ventral end of the second bronchial semi-ring, while it is partly encircled at its middle by the free end of the ventral extremity of bronchial ring I. (text-fig. 6, *B.r.I.*).

An examination of text-fig. 6, which is slightly diagrammatic, will shew the general form and relations of the parts so far discussed better than a mere description would do. In the first place, it will be noted, what answers to the ventral

ends of the fused rings forms a fan-shaped area of cartilage. The cartilaginous end of the free syringeal semi-ring corresponds in area with that of the fused rings. For the sake of clearness this semi-ring (text-fig. 6, *S.f.s.r.*) has been shown



Syrinx of the Jack Snipe (*Limnocryptes gallinula*), ventral aspect, shewing the peculiar form of the syringeal box, the intercalary bar, and the accessory cartilage. Note the attachment of the latter to the intercalary bar by the bundle of short fibrous strands.

*B.t.* = Broncho-trachealis muscle.

*Br.I.* = First bronchial semi-ring.

*Fr.* = Fused rings forming the syringeal box.

*S.f.s.r.* = Semi-fused syringeal semi-ring or intercalary bar.

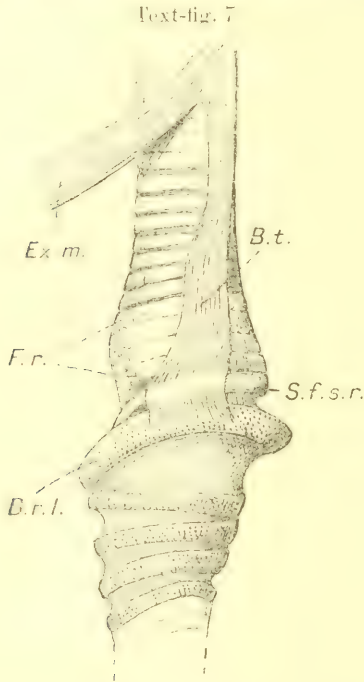
*L.c.* = Lingual cartilage or accessory cartilage.

*Fl.* = Fibrous ligament between the intercalary bar and the accessory cartilage.

forced apart from its normal attachment. Next it will be noticed that the campanulate mouth is divided into right and left moieties by a fibrous median partition forming a vertical pillar across the end of the trachea at its junction with the bronchi. This pillar answers to the "pessulus," and supports a vestigial semi-lunar membrane.

The free syringeal semi-ring constitutes a most remarkable

feature of this syrinx, and so far as I know it has been met with in no other bird, while its peculiarity is still more increased by the lingulate plate of cartilage attached thereto. That this intercalary semi-ring belongs to the syringeal and not to the bronchial system of rings is shown, I think, partly by its relationship to the syrinx and partly by the fact that the intrinsic muscles (text-fig. 6, *B.t.*) are attached to the next pair of semi-rings, which have all the form and relations of bronchial rings. Further, be it noted, they, like



Syrinx of Jack Snipe, seen from the left side.

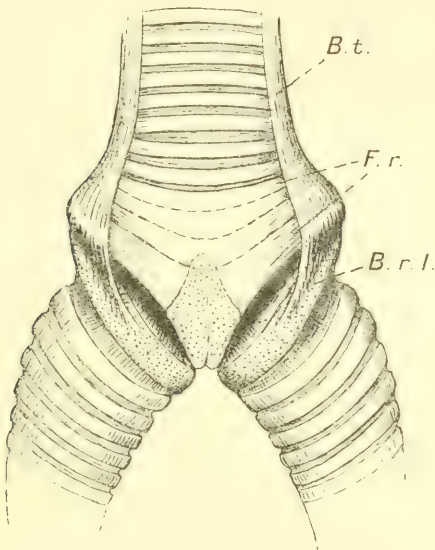
Additional letters: *Ex.m.* = Extrinsic muscle.

the rest of the bronchial rings, are wholly cartilaginous, while this peculiar semi-ring is partly osseous, agreeing in the extent of its ossification with the rings immediately cephalad.

In text-fig. 7 the general appearance of this syrinx in side view is shown, and should greatly assist the reader in grasping the peculiarities just described.

(2) *Common Snipe*.—Turning now to the syrinx of the Common Snipe, it will be noticed that it is similarly composed of four fused rings, and that these, as in the Jack Snipe, gradually increase in circumference to form a more or less campanulate syringeal box; but this campanulation is very slight, and might escape notice, but for the attention called to this region by the exaggerations of the Jack Snipe. Although, it will be noticed (text-fig. 8, *F.r.*), that the syrinx is formed of four fused rings as in the Jack

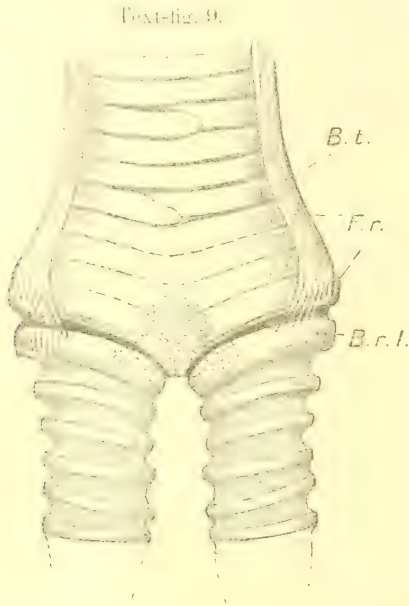
Text-fig. 8.

Syrinx of Common Snipe (*Gallinago caelestis*), ventral aspect.

Letters as in text-fig. 6, p. 337.

Snipe, the median cartilaginous area of the ventral aspect is much less and is almost confined to the free ends of the last, or hindmost, enlarged syringeal rings. The first bronchial ring, as in the Jack Snipe, is entirely cartilaginous; and there is no trace of what I have called the intercalary semi-ring. The intrinsic muscles have their normal insertion; and there is a rudimentary semi-lunar membrane, as in the Woodcock.

(3) *Woodcock*.—The syrinx of the Woodcock recalls that of the Common Snipe, but presents some characteristic differences. It is formed of four fused rings, but the hindmost, it will be noted (text-fig. 9, *F.r.*), is not produced backwards (downwards, according to the orientation of the drawing) to form such an acute V-shape, while the amount of cartilage in its ventral border is reduced. The first



Syrinx of Woodcock (*Gallinago rusticula*), ventral aspect.

Letters as in text-fig. 6.

bronchial ring differs from the rest of the series in being partly ossified, and its curvature also differs. But the most striking feature of this syrinx is seen in the intrinsic muscles, which are inserted for the most part into the syringeal box, only a few extremely delicate fibres, difficult to trace, attaining the normal goal of this muscle—the middle of the first bronchial semi-ring. This is a degenerate condition and one of no little interest.